

Applicant: William R. Bennett et al.
Application No.: 09/804,012
Filing Date: March 12, 2001
Page 2

REMARKS

Claim 28 was previously cancelled. Claims 1-27 and 29 are now pending in the application. Reconsideration and reexamination of the application, as amended, are respectfully requested.

In the Office action mailed on August 4, 2003, claims 1-4, 12-27 and 29 were allowed. Claims 5-11 were rejected. The previous rejection of claim 7 under 35 USC § 112, first paragraph, was maintained. Claim 5 was rejected under 35 USC § 102(b) as being anticipated by Sauer et al. (U.S. Patent No. 4,054,726), and claims 5 and 7 were rejected under 35 USC § 102(b) as being anticipated by Bennett (U.S. Patent No. 5,846,672). Claim 6 was rejected under 35 USC § 103(a) as being unpatentable over Sauer et al. in view of Bennett. Claims 6, 8, 9 and 11 were rejected under 35 USC § 103(a) as being unpatentable over Mansfield, Jr. et al. in view of Bennett. Claim 10 was rejected under 35 USC § 103(a) as being unpatentable over Bennett in view of Oltman et al. (U.S. Patent No. 5,567,538). Applicants respectfully disagree with the rejections for the reasons given below.

The rejection of claim 7 under § 112, first paragraph, was maintained. The Examiner asserted that the specification, while being enabling for a step along said side wall, does not reasonable provide enablement for "at least one step along said side wall" in line 7 of the claim. Applicants had argued that additional steps can be formed in the vertical portion of the can side wall in the same manner as the step shown in Fig. 1; i.e., by forming two additional radii, similar to radii y and 7, for each additional step. However, in the Office action mailed on August 4, 2003, the Examiner asserted that the original disclosure does not reasonably provide enablement for the additional radii, and the Figures are also limited to only one set of radii and one step formed therebetween. Applicants disagree.

Anode cups can be formed by any suitable metal forming process. Such processes are well known in the art. The Examiner has acknowledged that the specification is enabling for a step between radii 6 and 7 in Fig. 1. Just as the skilled person knows how to form a step in the side wall of the anode cup by forming radii 6 and 7, the skilled person would be able to form additional steps in the side wall between additional radii corresponding to 6 and 7. Evidence of the state of the prior art, the skill level of one of ordinary skill in the art and the availability of the starting materials and apparatus necessary to forming metal cell housing components such as

Applicant: William R. Bennett et al.
Application No.: 09/804,012
Filing Date: March 12, 2001
Page 3

anode cups, covers and the like that include multiple sets of radii and steps can be found in many publications. Examples include U.S. Patent No. 6,203,943 (Fig. 1), U. S. Patent No. 4,664,993 (Fig. 2) and U.S. Patent No. 2,546,379 (Figs. 2 and 8); courtesy copies of the front pages and pertinent drawing sheets are being submitted herewith.

For the above reasons, one of ordinary skill in the art would be able to make an anode cup having more than one step along the sidewall according to claim 7 without undue experimentation. Therefore, the enablement requirement of 35 USC § 112, first paragraph, is met in the present application.

Claim 5 was rejected under 35 USC § 102(b) as being anticipated by Sauer et al. The Examiner asserted that Sauer et al. discloses an anode cup having ...a step and a substantially vertical section between the step and the closed end, referring to Fig. 1. However, in the cell disclosed in Fig. 1, the section of the side wall between the step and the closed end of the anode cup forms an angle of approximately 15 degrees. This contrasts with the description on page 7, lines 3-4, of the present application, which states that "substantially vertical" means no more than about 6 degrees from the vertical. Therefore a substantially vertical section between the step and the closed end is not disclosed, nor is it suggested, by Sauer et al. For this reason, the rejection of claim 5 as anticipated by Sauer et al. is traversed.

Claims 5 and 7 were rejected under 35 USC § 102(b) as being anticipated by Mansfield, Jr. et al. (U.S. Patent No. 5,279,905). The Examiner asserted that Sauer et al. discloses an anode cup having ...a step and a substantially vertical section between the step and the closed end, referring to the Figure, in which the second vertical height (C) is greater than the first vertical height (D), so the resulting difference (C-D) would be greater than zero. This conclusion relies on dimensional relationships as measured in the Figure and assumes that those relationships are accurate for the cell disclosed in the specification. There is no explicit requirement for drawings to be to scale, and a drawing to scale is not required for the understanding of the invention disclosed by Mansfield, Jr. et al. In fact, the Figure is distorted. In the most preferred embodiment the copper layer 33 is from 1000 to 2000 microinches thick and the indium layer 34 is 1 to 3 microinches thick (column 3, lines 15-21), but the thicknesses of the copper and indium layers as shown in the Figure are about equal. In the Examples, the diameter and height of the cell are approximately 0.455 inch and 0.210 inch, respectively, a ratio of about 2.2:1, but in the

Applicant: William R. Bennett et al.
Application No.: 09/804,012
Filing Date: March 12, 2001
Page 4

Figure the corresponding measured dimensions have a ratio of about 1.2:1. Therefore, the cell in the Figure is not drawn to scale, and dimensional relationships determined from measurements taken from the Figure are not reliable. Because it is not drawn to scale, the use of relative dimensions determined from measurements of the Figure as a basis for rejecting claims 5 and 7 as anticipated by Mansfield, Jr. et al. is not proper, and the rejection is respectfully traversed.

Claim 6 was rejected under 35 USC § 103(a) as being unpatentable over Sauer et al. in view of Bennett and under 35 USC § 103(a) as being unpatentable over Mansfield, Jr. et al. in view of Bennett. The anode cup of claim 6 has a substantially vertical side wall between the step and the closed end of the cup, an internal diameter at the lower end (E) that is larger than a maximum external diameter above the step (A) and a ratio of the total cup height (M) to the step vertical midpoint that is greater than 3.

As shown above, neither Sauer et al. nor Mansfield, Jr. et al. disclose an anode cup with a substantially vertical side wall between the step and the closed end or a total height greater than three times the vertical height to the midpoint of the step. The Examiner asserted that the skilled artisan would have been motivated to combine the teachings of Bennett with the anode cup disclosed by either Sauer et al. or Mansfield, Jr. et al. to arrive at an anode cup with a ratio of a total cup height to a step vertical midpoint greater than 3 in order to maximize the cell's internal volume. However, doing so results in an anode cup with an internal diameter at the lower end that is smaller, rather than larger, than a maximum external diameter above the step, as recited in claim 6. Therefore, the combined teachings of neither Sauer et al. and Bennett nor Mansfield, Jr. et al. and Bennett contain all of the limitations of claim 6, and claim 6 is not obvious over either Sauer et al. or Mansfield, Jr. et al. in view of Bennett.

Bennett teaches that the cell's internal volume is increased in a manner different from the present invention — by enlarging the anode cup external diameter to equal that of the can. On the other hand, the cell using the anode cup according to claim 6 has a maximum diameter above the step and the crimped edge of the can that is smaller than the can diameter so the cell will fit within a conical cavity (page 3, lines 11-13). Bennett teaches away from the anode cup defined by claim 6.

Claims 8, 9 and 11 were rejected under 35 USC § 103(a) as being unpatentable over Mansfield, Jr. et al. in view of Bennett. These claims contain the limitations of claim 7, which,

Applicant: William R. Bennett et al.
Application No.: 09/804,012
Filing Date: March 12, 2001
Page 5

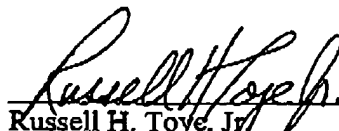
similar to claim 6, recites that the first internal cup diameter (E), measured at the lower end, exceeds the external cup diameter (A). The Examiner asserted that, for the same reasons recited above regarding the rejection of claim 6 as obvious over Mansfield, Jr. et al. in view of Bennett, the skilled artisan would be motivated to combine the teachings of the references. As also shown above, the combined teachings of the references relied on by the Examiner would result in an anode cup with a first internal cup diameter smaller, rather than larger, than the external cup diameter. The combined teachings of Mansfield, Jr. et al. and Bennett do not contain all of the limitations of claims 8, 9 and 11, and, for the same reasons applied to the obviousness rejection of claim 6, Bennett teaches away from the invention according to claims 8, 9 and 11. The same arguments can also be applied to claim 7.

Claim 10 was rejected under 35 USC § 103(a) as being unpatentable over Mansfield, Jr. et al. and Bennett, further in view of Oltman et al. As do claims 8, 9 and 11, claim 10 contains the limitations of claim 7. Claim 10 also recites that the total height of the anode cup is at least 1.78 inches. Oltman teaches that metal-air cells typically have heights ranging from 2.1 to 15 mm, which includes a height of at least 1.78 inches. However, the combination of these three references do not contain all of the limitations of claim 10, and Bennett teaches away from the combination, for the reasons given above regarding the rejections of claims 6, 8, 9 and 11 over Mansfield, Jr. et al. in view of Bennett.

For the above reasons, it is believed that claims 5-11, as well as 1-4, 12-27 and 29, are in condition for allowance. Withdrawal of the rejections and allowance of the application as amended are requested.

Respectfully submitted,

11/5/03
Date



Russell H. Toye, Jr.
Registration No. 43,200
Eveready Battery Company, Inc.
25225 Detroit Road
P.O. Box 450777
Westlake, OH 44145
(440) 835-7343